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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/595,454

04/20/2006

Gen Okiyama

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EXAMINER

TADAYYON ESLAMI, TABASSOM

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

09/14/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/595,454	<b>Applicant(s)</b> OKIYAMA ET AL.	
	<b>Examiner</b> TABASSOM TADAYYON ESLAMI	<b>Art Unit</b> 1792	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04/20/06.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>10/30/08, 04/20/06</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1- 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osamu Sumiya et al (Japanese Patent Publication: 2003-229141, here after Sumiya), further in view of Kazuhito Hatoh et al (U. S. Patent Application: 2003/0143454, here after Hatoh), and Thomas Soczka Guth et al (U. S. Patent: 6632847, here after 847), and Tsutomu Seki et al (Japanese Patent: 408148152, here after Seki).

Claims 1 and 3 are rejected. Sumiya teaches a method of making electrode membrane assembly for a fuel cell by coating negative electrode diffusion layer (104) with a substrate layer (106) coating the substrate layer with negative electrode layer (101, catalyst layer), coating the electrode layer with ion ex-change layer(103, electrolyte layer) comprising to form electrolyte membrane [0011, 1112], coating the electrolyte membrane with positive electrode layer(102, catalytic layer), and coating the positive diffusion layer(105) with a substrate layer(107) to produce an electrode assembly membrane[fig. 9, 0005, abstract]. Sumiya does not teach coating the electrolyte membrane with positive electrode layer(102, catalytic layer), and superimposing on the other electrode layer a two layer body formed by coating the positive diffusion layer(105) with a substrate layer(107) to produce an electrode

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assembly membrane. Hotah teaches a method of making a fuel cell [abstract], where positive electrode layer (3 and 4) is laminated on electrolyte layer coated with catalytic layer (1 and 2) [fig. 1, 0090]. In fact Hotah teaches forming the electrode layer separately and then bring it in contact with electrolyte layer assembly. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of making electrode assembly as Sumiya teaches where the layer assembly that Sumiya teaches superimposed with positive electrode layer (105) and (107) as Hotah teaches, because Hotah teaches it is suitable method of making fuel cells.

Although Sumiya does not clearly teaches applying the negative electrode layer before the substrate layer is dried, or applying the electrolyte layer before the substrate layer is dried, however Sumiya teaches for reducing the adhesion defects and improving adhesion between the layers, a coating solution has to be applied to a layer before the layer is completely dried [0010]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of making electrode assembly as Sumiya and Hotah teach where each layer is coated on previous layer before the previous layer gets dried to increase the adhesion between the layers as Sumiya teaches. Sumiya also teaches drying the structure under no load [0015].

Sumiya does not teach the electrolyte (ion-exchange layer) comprising hydrocarbon solid polymer. 847 teaches a method of making a polymer ion change membrane for fuel cell [abstract], which comprising dissolving a solid polymer in a solvent comprising hydrogen and carbon [column 2 lines 32-36, column 7 lines 3-9] and coating the substrate with it. Therefore, it would have been obvious to one of ordinary skill in the art

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at the time of invention was made to have a method of making electrode assembly as Sumiya teaches where the electrolyte layer is taught by the method that 847 teaches, because 847 teaches a suitable electrolyte for making fuel cells. 847 also teaches drying the electrolyte layer at temperature of 80-140C[column 8 lines 60 to end, column 9, lines 1-2] which is inherently less than the decomposition temperature of the polymer, otherwise the device would be useless. The do not teach placing electrode membrane assembly in vapor and removing eth solvent from electrolyte membrane with vapor . Seki teaches a method of making fuel cells where he electrode membrane is placed in water vapor and heat to remove the solvent to avoid forming cracks[abstract, constitution]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of making electrode assembly as Sumiya and 847 teach where the solvent is removed under vapor, because Seki teaches it helps to avoid forming cracks.

Claim 2 is rejected for the same reason claim 1 is rejected. It is inherent that the solvent should be removed at lower temperature than the decomposition of the polymer, otherwise the device is useless.

Claim 4 is rejected, 847 teaches the solvent is N-methyl1-2-pyrrolidone [column 7 lines 3-9]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of making electrode assembly as Sumiya Hotah, 847 and Seki teach where the solvent is N-methyl1-2-pyrrolidone as 847 teaches, because 847 teaches it is suitable solvent for hydrocarbon polymers usable as electrolyte in fuel cells.

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Claim 5 is rejected for the same reason claims 2 and 3 are rejected.

Claims 6-8 are rejected for the same reason claims 2-3, 5 and 4 are rejected.

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TABASSOM TADAYYON ESLAMI whose telephone number is (571)270-1885. The examiner can normally be reached on 7:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tabassom T. Tadayyon-Eslami  
Examiner  
Art Unit 1792

/Tabassom T. Tadayyon-Eslami/  
Examiner, Art Unit 1792

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/Michael Cleveland/  
Supervisory Patent Examiner, Art Unit 1792